Claims:

A system comprising:

an ATM (asynchronous transfer mode) switch having a plurality of pairs of input and output ports each having different port numbers assigned thereto, wherein an ATM cell arriving at an input port is transferred to an output port depending on internal header information added to the ATM cell;

an incoming line circuit connected to each of a plurality of input ports of the ATM switch; and

an outgoing line circuit connected to each of a plurality of output ports of the ATM switch

wherein the incoming line circuit comprises:

a cell discriminator for discriminating a first OAM (operation, administration, and maintenance) cell requiring a response among ATM cells received from a corresponding incoming line; and

a cell data converter for converting the first OAM cell to a second OAM cell with internal header information indicating an output port of the ATM switch corresponding to the corresponding incoming line so that the second OAM cell is transferred to the output port corresponding to the corresponding incoming line to be sent through a corresponding outgoing line circuit.

2. The system according to claim 1, wherein the incoming line circuit further comprises:

a header conversion table including an output port number and connection information for each of possible connections identified by header information of incoming ATM cells and further containing endpoint information indicating whether the system is an endpoint of an OAM flow for each level in ATM layer for each of the possible connections; and

a header converter for converting an incoming ATM cell by searching the header conversion table for an output port number and connection information according to header information of the incoming ATM cell to add the output port number and connection information to the header information of the incoming ATM cell,

wherein

the cell discriminator discriminates an AIS (Alarm Indication Signal) cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for each level in ATM layer and further discriminates a loopback cell when the system is set to a loopback point, and

the cell data converter converts the AIS cell to an RDI (Remote Defect Indication) cell and further converts the loopback cell to a return loopback cell.

3. The system according to claim 2, wherein the cell

discriminator further discriminates an RDI cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for each level in ATM layer, a CC (Continuity Check) cell, and a return loopback cell that is a response to a loopback cell transmitted by the system,

wherein the system further comprises:

a terminator for terminating the RDI cell, the CC cell and the return loopback cell that are discriminated by the cell discriminator.

4/12 The system according to claim 3, wherein the incoming line circuit further comprises:

an OAM table including an AIS flag for instructing AIS cell transmission and an RDI flag for instructing RDI cell transmission, and OAM cell setting information for each of the possible connections;

a flag monitor for monitoring the AIS and RDI flags of the OAM table at regular intervals to determine whether a set one among the AIS and RDI flags exists; and

an OAM cell transmission controller controlling such that

when an AIS flag for a connection is set, an AIS cell is produced based on the OAM cell setting information for the connection and is transferred to the ATM switch, and

when an RDI flag for a connection is set, an RDI cell with an output port number associated with an input port

corresponding to the incoming line circuit is produced based on the OAM cell setting information for the connection and is transferred to the ATM switch.

5/13 The system according to claim 4, wherein an ATM cell which is not discriminated by the cell discriminator is converted such that header information thereof is changed to the connection information added by the header converter and is transferred to the ATM switch.

6/14 The system according to claim 4, wherein the incoming line circuit further comprises:

an OAM table controller controlling such that, when an AIS cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for a level of virtual path connection (VPC) has been received, an AIS flag instructing an AIS cell relative to a level of virtual channel connection (VCC) subordinate to the VPC to be transferred is set in the OAM table.

7. The system according to claim 1, wherein the incoming line 1165 circuit further comprises:

a first queue 104 for queuing first cells having internal header information indicating an output port of the ATM switch corresponding to the corresponding incoming line;

a second 105 queue for queuing second cells other than

the first cells; and

a shaper (61) for shaping transfer of the first cells from the first queue to the ATM switch so as to ensure communication quality of the second cells queued in the second queue.

8. (Fig 5) The system according to claim 7, wherein the incoming line circuit further comprises:

an output (62) controller controlling such that higher priority is given to transfer of the first cells over that of the second cells.

9. A method for controlling OAM (operation, administration, and maintenance) processing in a system including an ATM (asynchronous transfer mode) switch having a plurality of pairs of input and output ports (each having different port numbers assigned thereto), wherein an ATM cell arriving at an input port is transferred to an output port depending on internal header information added to the ATM cell, wherein an incoming line circuit connected to each of a plurality of input ports of the ATM switch, and an outgoing line circuit connected to each of a plurality of output ports of the ATM switch, the method comprising the steps of:

at an incoming line circuit,

a) discriminating a first OAM cell requiring a response among ATM cells received from a corresponding incoming

line: and

b) converting the first OAM cell to a second OAM cell with internal header information indicating an output port of the ATM switch corresponding to the corresponding incoming line so that the second OAM cell is transferred to the output port corresponding to the corresponding incoming line.

10. The method according to claim 9, further comprising the steps of:

at an incoming line circuit,

storing an output port number and connection information for each of possible connections identified by header information of incoming ATM cells and further containing endpoint information indicating whether the system is an endpoint of an OAM flow for each level in ATM layer for each of the possible connections: and

converting an incoming ATM cell by searching the header conversion table for an output port number and connection information according to header information of the incoming ATM cell to add the output port number and connection information to the header information of the incoming ATM cell,

wherein the step (a) discriminates an AIS (Alarm Indication Signal) cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for each level in ATM layer and further discriminates a loopback cell when the system is set to a

loopback point, and

the step (b) converts the AIS cell to an RDI (Remote Defect Indication) cell and further converts the loopback cell to a return loopback cell.

11. The method according to claim 10, wherein the step (a) further discriminates an RDI cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for each level in ATM layer, a CC (Continuity Check) cell, and a return loopback cell that is a response to a loopback cell transmitted by the system,

the method further comprises the step of:

terminating the RDI cell, the CC cell and the return loopback cell that are discriminated by (the cell discriminator).

12. The method according to claim 11, further comprises the steps of:

at the incoming line circuit,

storing an AIS flag for instructing AIS cell transmission and an RDI flag for instructing RDI cell transmission, and OAM cell setting information for each of the possible connections;

monitoring the AIS and RDI flags of (the OAM table) at regular intervals to determine whether a set one among the AIS and RDI flags exists;

when an AIS flag for a connection is set, producing

an AIS cell based on the OAM cell setting information for the connection and is transferred to the ATM switch; and

when an RDI flag for a connection is set, producing an RDI cell with an output port number associated with an input port corresponding to the incoming line circuit based on the OAM cell setting information for the connection and is transferred to the ATM switch.

13. The method according to claim 11, wherein an ATM cell which is not discriminated by the cell discriminator is converted such that header information thereof is changed to the connection information added and is transferred to the ATM switch.

14. The method according to claim 11, further comprises the step of:

when an AIS cell having a connection relative to endpoint information indicating that the system is an endpoint of an OAM flow for a level of virtual path connection (VPC) has been received, setting an AIS flag instructing an AIS cell relative to a level of virtual channel connection (VCC) subordinate to the VPC to be transferred in the OAM table.